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ABSTRACT OF THE DISCLOSURE

A method for identifying and modeling nonlinearities in communications channels, particularly optical communication channels. A channel in general is modeled as a summation of linear and non linear terms having memory. The terms are functions of the input to the channel with respect to time, such as a sequence of input bits to the channel. In one embodiment the most recent input bits are used to access a value in a look up table. The value accessed is compared to an actual value received from the channel. The difference between the value in the table and the actual channel value may be used to correct the value in the table. When the look up table and the channel converge the look up table contains a model of the channel with memory that can model nonlinearities. A nonlinear channel having memory may also be modeled in terms of Volterra Kernels.